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ARPN Journal of Engineering and Applied Sciences Open Access
Volume 10, Issue 23, 2015, Pages 17438-17443

The development of human biometric identification using acceleration plethysmogram (Article)

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Abstract

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This study explicates the practicability of using acceleration plethysmogram (APG) signal in biometric identification . The introduction of APG signal is initiated from the congenital of photoplethysmogram (PPG) signal since APG signal has been widely known as the second derivative of PPG signal. Previous researchers claimed that APG signal elucidates more information as compared to PPG signal. For this reason, the robustness and reliability of APG signal as biometric recognition is demonstrated. A total of 10 subjects obtained from MIMIC II WAFEFORM Database (MIMIC2WDB) which provides PPG signals with a 125 Hz sampling frequency are used as test samples. The signals are then differentiated twice to obtain the APG signals. Then, discriminative features are extracted from the APG morphology. Finally, these APG samples were classified using commonly known classification techniques to identify individuals. Based on the experimentation results, APG signal when using Multilayer Perceptron gives an identification rate of 98% as compared to PPG signal of 76% for the same waveform. This outcome suggests the feasibility and robustness of APG signals as a biometric modality as an alternative to current techniques.

SciVal Topic Prominence

Topic: Electrocardiograph | Biometry | Forensic Anthropology

Prominence percentile: 90.844

Author keywords

APG Biometric MIMIC2WDB Multilayer perceptron PPG

ISSN: 18196608
Source Type: Journal
Original language: English
Document Type: Article
Publisher: Asian Research Publishing Network

References (12)

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